

Original article:

Study of Histomorphological pattern of soft tissue tumours in western Maharashtra

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Abstract:

Introduction: It will not be an exaggeration if we call last two decades as revolution in understanding of soft tissue tumors on all aspects such as clinical, investigative, molecular & therapeutic. With this background in mind present study was planned to study the histomorphological patterns of soft tissue tumors using H & E stain with immunohistochemistry (IHC) wherever necessary over a period of 5 years in western maharashtra.

Methodology: The present study includes all the soft tissue tumors benign, intermediate & malignant (301) from the department of pathology, during the period of May 2008 to April 2013.

Observations and results: In the Present study benign soft tissue tumors outnumber the malignant, and the commonest tumor type was adipocytic tumors. IHC was performed in 15 cases. Out of 15 cases, in 10 cases the light microscopic diagnosis was confirmed on IHC, in 3 cases light microscopic diagnosis was given as 'High grade sarcoma' & further typing was done on IHC & 2 cases showed disparity between the light microscopic & immunohistochemical diagnosis.

Conclusion: IHC markers were very useful for diagnosis of STTs especially in round cell, monomorphic & pleomorphic spindle shaped & pleomorphic epithelioid tumors. Selection of few specific positive & negative markers is important for diagnosis & their cost effectiveness.

Keywords: IHC markers, soft tissue tumors

INTRODUCTION

It will not be an exaggeration if we call last two decades as revolution in understanding of soft tissue tumors on all aspects such as clinical, investigative, molecular & therapeutic. Tumors arising from non epithelial extra skeletal tissue of the body excluding the reticuloendothelial system, glia and supporting tissue of various parenchymal organs¹ is the definition of soft tissue tumors. There seems to be an upward trend in the incidence of soft tissue tumors, but it is not clear whether this represents a true increase or reflects better diagnostic capabilities & greater interest in this type of tumors & the newer advances taking place in the field of soft tissue tumors. They constitute a large & heterogenous group of neoplasms consisting of greater than 200 benign types of neoplasms & 90 malignant conditions.² Though benign tumors like lipomas & hemangiomas are common, malignant tumors are rare. So the period of study undertaken is 5 years. Several changes in the nomenclature, classification, lineage placement have occurred in these tumors with the advent of Immunohistochemistry(IHC), cytogenetics & electron microscopy(EM) findings. When we started working the WHO classification was of 2002, however in last few months of this study (February 2013) new WHO classification came with several changes than the older one of 2002. This made the study more interesting. With this background in mind present study was planned to study the histomorphological patterns of soft tissue tumors using H & E stain with immunohistochemistry (IHC) wherever necessary over a period of 5 years in western maharashtra.

MATERIALS & METHODS :

The present study was approved by IEC from our university. The present study includes all the soft tissue tumors benign, intermediate & malignant (301) from the department of pathology, during the period of May 2008 to April 2013. The estimation of sample size was determined with the help of expert.

This is an observational study of soft tissue tumors. A detailed clinical data including history, physical examination and relevant investigations were noted as shown in the proforma which is enclosed. The specimens received were in the form of incisional biopsy, excision biopsy & radical specimens. All intermediate grade & malignant tumors and approximately 40% of the benign tumors were initially biopsied followed by radical excision. Majority of benign neoplasms which we received came to us as excision biopsies. A considerable number of neoplasms also had undergone FNA preceding to it's radical excision. The specimens were received in the department of pathology and gross findings like size, shape, colour, consistency, cut surface were noted. In selected cases gross photographs were taken. The specimens were fixed in 10% formalin.

Sections for histology:

- a) Tumor: Four sections or more were taken depending on size & extent of tumor. All grossly dissimilar areas should be sampled. Sections should be taken to include the periphery of the tumor & adjacent fat, muscle, overlying skin, vessels & nerves.
- b) Previous incision site, if present taken all along it's course.
- c) Lymph nodes: representative ones.
- d) Proximal margins of resection: Subcutaneous fat & muscles.

Bits were processed, 5-6 micron thin sections were cut, and studied under light microscopy after H & E staining. Immunohistochemical studies were done in selected cases wherever necessary. Paraffin blocks were sent to Mumbai & slides with the marker were sent back to us in prospective cases. Photographs were immediately taken as stains get faded early. Histomorphological study of 301 soft tissue tumors was done. The parameters included were age, sex, site, clinical history, relevant investigations, histomorphological features and immunohistochemical features in selected cases.

OBSERVATIONS & RESULTS

Table 1) **DISTRIBUTION OF SOFT TISSUE TUMORS AS PER THE ORIGIN**

Origin	Number	Percentage
Adipocytic	165	54.81
Fibroblastic	13	4.31
Fibrohistiocytic	06	1.99
Smooth muscle	05	1.66
Pericytic	00	0
Skeletal muscle	00	0
Vascular	76	25.24
Chondro-osseous	01	0.33
GIST	01	0.33

Nerve sheath	29	9.63
Tumors of uncertain differentiation	04	1.32
Undifferentiated/unclassified sarcoma	01	0.33
Total	301	100

Adipocytic tumors formed the commonest soft tissue tumors in present study & formed 54.81% of all soft tissue tumors.

The commonest fibroblastic tumor was Dermatofibrosarcoma protuberans forming 53.84 % of all fibroblastic tumors. The commonest fibrohistiocytic tumor was benign fibrous histiocytoma forming 83.33 % of all fibrohistiocytic tumors. The commonest tumor in the category of smooth muscle tumors is Leiomyosarcoma forming 60% of total smooth muscle tumors. Capillary hemangiomas formed the commonest tumor in category of vascular tumors constituting 72.36% of all vascular tumors. Neurofibromas formed the commonest group forming 58.62% of all nerve sheath tumor. Myxomas formed the commonest group forming 50 % of all tumors of uncertain differentiation. One case of soft tissue chondroma, 1 cases of malignant GIST & 1 undifferentiated pleomorphic sarcoma were noted. IHC was done in 10 malignant tumors out of 17. It was not done in total 7 cases. It was done in 2 locally aggressive intermediate tumors namely fibromatoses & 3 benign tumors namely benign triton tumor, schwannoma & diffuse neurofibroma; total making 15 cases for IHC.

DISCUSSION

The purpose of taking soft tissue tumors was there is a lot of change in their nomenclature, classification, diagnosis, new IHC markers and treatment modalities for these tumors. Another reason for taking this study was that the older studies have not included “intermediate” category which we included & divided the tumors into 2 categories as locally aggressive & rarely metastasizing. We also did the IHC markers for the malignant tumors wherever necessary for diagnosis. The findings in our series are partly different from their’s due to these reasons.

Intermediate category tumors in the present study were 12. As far as the intermediate category no other series has categorized them separately, so comparison could not be made.

The commonest malignant tumor in the present study was liposarcoma, which constituted 23.52% followed by fibroblastic & smooth muscle tumors both constituted 17.64% each. In series by Kransdorf et al³ fibrohistiocytic tumors were the commonest followed by liposarcoma & B.Hassawi⁴ got muscle tumors as the commonest type. The most common site for benign soft tissue tumors in the present study was head & neck region which is similar to the study of Geetha Dev.⁵ However, Kransdorf et al³ got upper extremity as the commonest site. Unlike the benign tumors the malignant soft tissue tumors were observed to have a strong predilection for lower extremities forming 47%. This is in parallel with study of Kransdorf.^{3,4} In our series number of tumors may not be statistically significant however this is similar to findings in a larger series.

The majority of benign vascular tumors were lobular capillary hemangioma which is comparable with Geetha Dev⁵ & B.Hassawi.⁴ Benign tumors of nerve sheath were 27 (9.96%). Neurofibroma was the commonest benign tumor in this group followed by Schwannoma. In soft tissue tumors spindle cells, epithelioid cells, round cells, pleomorphic cells, myxoid change, arrangement in sheets are the common findings each including groups of soft tissue tumors with different lineage & IHC solves the problem in malignant tumors but sometimes even in

benign & borderline tumors. Such groups also include carcinomas (in epithelioid) lymphomas (in round cells) & melanomas & this differentiation is also possible with IHC only, as in alveolar RMS. IHC can not differentiate between benign & malignant tumors however on light microscopy close differential diagnosis varies from benign to malignant, such as spindle cell hemangioma vs low grade Kaposi sarcoma. In this case IHC confirmed the lineage & so the diagnosis. In pleomorphic spindle cell tumors, tumors of all the other lineages need to be ruled out as in high grade myxofibrosarcoma. However if clinical & histological criteria are critically evaluated & are typical one can achieve definitive diagnosis on light microscopy & IHC confirms it such as in case of high grade myxofibrosarcoma.^{6,7}

IHC was done in 2 more cases of benign tumors. One was benign triton tumor for its documentation & the other was diffuse neurofibroma of leg presenting as elephantiasis. Both were rare.

IHC is also used to confirm a rare diagnosis & for documentation as in case of 'Neuromuscular Hamartoma'. In the present study, IHC was performed in 15 cases. Out of 15 cases, in 10 cases the light microscopic diagnosis was confirmed on IHC, in 3 cases light microscopic diagnosis was given as 'High grade sarcoma' & further typing was done on IHC & 2 cases showed disparity between the light microscopic & immunohistochemical diagnosis. Comparison of IHC study was made with B. hassawi et al.

CONCLUSIONS

IHC markers were very useful for diagnosis of STTs especially in round cell, monomorphic & pleomorphic spindle shaped & pleomorphic epithelioid tumors. Selection of few specific positive & negative markers is important for diagnosis & their cost effectiveness. Limitations of IHC markers should be known.

It is better to send the blocks at such a center where the IHC slides can be received back so that reading them is possible, especially in teaching institutes. It is necessary to take the photographs immediately as the slides get faded away.

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